



### Location

CCG-Center, Technologiepark  
Argelsrieder Feld 22, bldg. TE 03, D-82234 Wessling-Oberpfaffenhofen  
A list of nearby accommodations, a description of the location and hints for travel will be mailed to the participants upon registration. Please make your own hotel accommodation.

### Fee

EUR 1.375,-  
CCG is a non-profit organisation, exempt from value-added tax in Germany. For foreign seminar locations the local tax regulations are applicable.  
Members of CCG receive a discount of 10 %. Where several employees from one company / office apply for the same course, each participant will receive a discount of 10 %. For students special rates are available on request. Discounts cannot be combined.  
Please pay by non-cash means after receiving the invoice.

### Registration

Please write or call (up to 3 weeks before the seminar) to Carl-Cranz-Gesellschaft e.V.; Argelsrieder Feld 22, D-82234 Wessling Tel. +49 (0) 8153 / 88 11 98 -12, Fax -19, E-Mail: anmelden@ccg-ev.de  
**Internet:** www.ccg-ev.de  
After receipt of registration, a confirmation letter will be sent.

### Further Information

For more information about our organization please do not hesitate to contact the CCG at Oberpfaffenhofen at the phone number given above.  
For more information on the content of the seminar please contact

Prof. Dr. Daniel W. O'Hagan  
Fraunhofer FHR, D-53343 Wachtberg-Werthhoven  
Phone: +49 (0) 228 9435-389, E-Mail: daniel.ohagan@fhr.fraunhofer.de

### Substitutions and Cancellations

Substitutions may be made at any time. Cancellation of an accepted registration made up to 10 days prior to the start of the seminar is subject to a EUR 25,- administrative fee. Participants canceling after that date are responsible for the entire seminar fee.  
CCG reserves the right to cancel a course up to 10 days before the course's beginning in case of low number of participants or for other significant reasons. Furthermore, CCG reserves the right, against the announcement in the programme, to possibly replace at short notice a lecturer and also the lecturer's topic. Any claims for damages shall be excluded.

### Focus

Passive Radar (PR) utilises pre-existing transmitter infrastructure to illuminate targets. Examples of „Illuminators of Opportunity“ (IoO) include FM radio, terrestrial digital TV (DVB-T/2), LTE, and Satellite-based illuminators. Passive Radar is a maturing technology, with several products available on the market. PR is still, nevertheless, an emerging technology owing to the fact that new and emerging potential Illuminators are coming online – such as the use of emerging satellite constellations like Starlink as well as 5G based transmissions. This 2-day course will cover the fundamental principles of Passive Radar and will provide details of advanced sensing applications.

### Who Should Attend

This course will be of relevance to all researchers and engineers involved either directly or indirectly with Passive Radar technology. Passive Radar “*know how*” is also highly relevant for numerous current and future national and international projects. In the event of Passive Radar deployment in future conflicts, then this course will also be of interest to colleagues in the EW community.

### Lecturer

Daniel W. O'Hagan   Prof. Dr.   Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, Wachtberg-Werthhoven

### Seminar SE 1.17

## Introduction to Passive Radar

April 18 – 19, 2023  
Oberpfaffenhofen near Munich

### Scientific Coordination

Prof. Dr. Daniel W. O'Hagan  
Fraunhofer FHR, Wachtberg-Werthhoven

## Seminar Outline

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**Tuesday, April 18, 2023**  
**08.30 – 17.00**

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08.30 – 08.45 CCG	Introduction
08.45 – 10.00 D. W. O'Hagan	<b>Historical Context</b> The course will begin by placing Passive Radar in historical context. This context is important as it sheds light on <b>why</b> (not only <b>how</b> ) Passive Radar is used
10.15 – 12.00 D. W. O'Hagan	<b>Introduction to Passive Radar &amp; Essential Theory</b> This lecture imparts the advantages and challenges associated with Passive Radar – in the context of other potentially viable solutions. Here we will study the fundamental theory of Passive Radar that is essential for a full understanding of the subsequent lectures
13.00 – 15.00 D. W. O'Hagan	<b>Passive Radar Coverage</b> This lecture will consider the various parameters associated with creating a Passive Radar coverage map (mission planning). SNR, bistatic RCS – investigating the claim that Passive Radar has counter-stealth properties, direct-signal interference, integration-gain, etc., will be studied in this section. Worked examples will be performed to reinforce important points
15.15 – 17.00 D. W. O'Hagan	<b>Characterisation of Illuminators of Opportunity</b> This lecture will analyse the salient characteristics of potential Illuminators of Opportunity (IoO) for Passive Radar applications. The number and diversity of IoOs is increasing and careful thought has to be given to the ultimate design goals of a Passive Radar system. Emerging (potential) illuminators, such as Star-Link, will be discussed in this lecture

**Wednesday, April 19, 2023**  
**08.30 – 17.00**

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08.30 – 10.00 D. W. O'Hagan	<b>Who develops and uses Passive Radar?</b> As a means to illuminate Passive Radar technology, this lecture will focus on the organisations that develop and those that use Passive Radar. We will study real-world systems and application areas. Furthermore, an overview will be provided on the numerous NATO scientific panels dedicated to the advancement of Passive Radar technology. The case-studies in this lecture will equip participants with an overview of the state-of-the-art vis-à-vis Passive Radar, as well as likely future trends and applications
10.15 – 12.00 D. W. O'Hagan	<b>Passive Radar Design I</b> This part of the seminar will be interactive. The participants will be provided with a scenario that requires surveillance coverage. Owing to certain factors that will be explained, participants and lecturer will work together to investigate whether, and to what extent, a Passive Radar might fulfill the required specifications
13.00 – 14.30 D. W. O'Hagan	<b>Passive Radar Design II</b> This part of the lecture continues the design case-study. The proposed solution will be evaluated by participants and then assessed to determine its ability to fulfill the original objectives. This interactive design exercise is intended to provide participants with insight as to why and how Passive Radar is used for certain surveillance applications. The design exercise will consolidate the preceding lecture content for richer learning outcomes
15.00 – 17.00 D. W. O'Hagan	<b>Advanced Topics: Passive Radar on Moving Platforms and Passive Radar Countermeasures</b> The seminar concludes with a lecture on the advanced topics of Passive Radar on Moving Platforms and Passive Radar Countermeasures

## Material

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Each attendant will be provided with detailed course material in English.

## Language

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English

## Additional Courses

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- „Grundlagen der Hochfrequenztechnik für Ingenieure und Wissenschaftler“, 7.–9.2.2023 (Code SE 1.18)
- „Grundlagen der Radartechnik“, 20.–22.6.2023 (Code SE 2.01)
- „Radar Signal Processing: Fundamentals, Applications, and Advanced Topics“, 3.–7.7.2023 (Code SE 2.08)